TRMM Flight Operations Summary

June 14, 1999

FOT Overview

- Key Issues to be discussed
  - FOT Staffing and project status
  - PSIB Counter Patch
  - Solar Array Parking Status
  - CERES operational change status
  - Y2K conversion status
  - Subsystem Overview

FOT Overview

- Operations Status - Engineering Staff
  - Flight Ops Summary - Lou Kurzmiller
  - Training & Certification Status - Ave Kludze
  - Thermal, Electrical, & Power - Ave Kludze
  - RCS - Andy Calloway
  - Deployables & ACS - Joe Kowalski
  - FDS, C&DH, RF, & CERES - Ed Weidner
  - VIRS - Ave Kludze
  - TMI & PR - Joe Kowalski
  - LIS - Andy Calloway
  - Ground System & Y2K upgrade - Ed Weidner

Flight Operations Summary

- Staffing
  - Losing two Console Analysts in July
    - » Conducting job interviews for replacements
  - One Day Engineer on maternity leave
    - » Baby boy on 29 May 99
    - » Expected return: Last week of July
- IMOC
  - IMOC Preliminary Ops Concept presentation on 10 June

Flight Operations Summary

- Overall Support in May
  - Supported 490 SN events -- including 2 late acquisition occurrances
  - Recovered all available science and housekeeping data
  - 7 Delta V maneuvers and 2 Yaw maneuvers (now +X Forward)
  - FOT worked Power, CERES, Propulsion (Cat Bed Htrs), Deployables

Training

- Most recent hire preparing to take final two tests for Command Control Certification
- New Hire/Exist Hire LOP checklist has been created
- Hands-on training has begun with Flight Software at STTF

Thermal Subsystem

- Thermal subsystem performed nominally
- High thermal conditions experienced on solar array drive remains a serious concern, monitoring continues
- No open Anomaly or Event Reports
- No outstanding issues

Electrical Subsystem

- Electrical subsystem performed nominally
- No open Anomaly or Event Reports
- No outstanding issues

Power Subsystem

- On 99-137: TSMs #31& 32 (Battery EOD monitor) failed as predicted (Anomaly #72)
  - Batteries 1 & 2 SOC counter fell below 94.99-95%, tripping TSMs 31 & 32 (RTS-13 executed)
    - » Voltages remained nominal
    - » Decision was made not to disable these TSMs first, RTS 13 does not change the charge profile
- On 99-138: PSIB A Orbit Status (Day/Night Flag) stuck in day mode (Anomaly #73) - no effect on nominal charge operations
- On 99-138: C/D charge ratio was changed from 1.030 to 1.020 since voltages were nominal
  - This effectively controls when trickle charge is entered

Power Subsystem

- Recoveries
  - On 99-154: Successfully corrected the Orbit Status (Day/Night) problem via Hex command.
  - On 99-155: Changed C/D ratio from 1.020 to 1.025 prior to re-enabling Auto-Spru
    - » Raising the C/D ratio decreases the trickle charge time
  - Batteries SOC reaching 100%
- Open issues
  - Change charge settings for future solar array scenario
  - FSW will be providing Hex commands to reset other routines as needed
  - New CCR to develop software fix (patch) has been opened

Power Subsystem

- Open Anomalies
  - #55 Battery 2 Cell 1 Hitting YH and RH limits
  - #72 TSM 32 Battery 2 End of Day state of charge
  - #73 PSIB side A orbit status unchanged

RCS Subsystem

- RCS performed nominally through Delta-V maneuvers #95 - #100
- Fuel remaining is 727.23 kg of hydrazine
- All operating temperatures remain nominal
- All heater operations remain nominal
- No Open RCS Anomaly or Event Reports
- Starting with Delta-V #99, Catbed Heaters are being turned on 45 minutes prior to the first burn - was originally 91 minutes

Deployables Subsystem

- -Y solar array reached max of 37.3° C (yellow high 42° C) for the past month
- Parking -Y solar array at 30°
  - End to end parking of array scenario tested with STTF
  - ACS and Power test results are being finalized
  - S/C RTS #5(SUNACQ) modified to include GSACE Sequence Enable command and tested with STTF
  - Formal Readiness Review scheduled for June 23rd
- Finalizing contingency plans for possible array failure

ACS Subsystem

- Open Issues
  - Yaw Updates show seasonal trend
    - » September is next time 1 Sigma requirement could be exceeded
    - » FDF Seeking budget approval for calibration analysis and implementation
  - ESA fogging
    - » ACS looking into preliminary options such as adjusting ESA biases
    - » Current plots show this should not be a factor during expected mission life
  - AR #60 - TDRS EPVs still sometimes fail in position and velocity following TDRS maneuvers
    - » New table 85 with updated position & velocity numbers being generated and tested at the STTF

ACS Subsystem

- Open Issues (Continued)
  - Parking of -Y solar array
    - » Contingency Tables (54 & 66) to relieve torque imbalances due to failed array or when array is parked have been generated and tested
    - » ACE RAM patch needed from FSW to reduce torque gain in SAFEHOLD
    - » ACS NASA engineers finishing High Fidelity test results of parked array with yaw maneuver and failed reaction wheel
    - » FOT Implementation Sequence Plan being finalized and will be presented at the Readiness Review

ACS Subsystem

- Closed Issues
  - Parking of -Y solar array
    - » Contingency plan to fire one-shot thruster pulses if array fails and momentum builds tested
    - » ACS NASA engineers reviewed FDC limits that might change with parking the -Y Solar Array
      - No planned changes except FDC #103 (High System Momentum X-axis)

FDS Subsystem

- UTCF Adjustments on 99-132 (-895), 141 (-931), and 149 (-852)
- Invalid Stream ID due to VIRS on 99-133
- Q-starts, MS, and Flywheel

C&DH Subsystem

- FS Adjust on 99-149; now drifting slightly positively
- PR Retry error on 99-121
- EDACs

RF Subsystem

- Frequencies still behaving consistently
- Generic Late Acqs on 99-132 and 139

CERES Instrument

- Next turn on period is scheduled for middle of June 17/18 for Australia ground test
  - Short 3 hour turn-ons for 20 consecutive days
- Open issues
  - Awaiting closure of Anomaly Report #69 - CERES DAA High Voltage on +15 V converter
  - CERES removal from load-shed work continues
    - » All scenarios have been successfully tested
    - » Awaiting new TSMs for CERES current monitoring

VIRS Instrument

- Voltages and temperatures are nominal
- Anomaly Report #56 (VIRS Reset) is still open
- No outstanding issues

TMI Instrument

- All temperatures, currents, and voltages are within limits
- No Open Issues

PR Instrument

- All temperatures, currents, and voltages are within limits
- NASDA command requests for the month of May
  - External Calibrations
  - Initially three External Calibrations scheduled but two were mistakenly left off the daily ATS load (Event Report #102)
  - One additional External Calibration scheduled to cover the missed two
- Open Issues
  - Event Report #102
    - » All Day-staff FOT members who receive TSDIS command request emails now verify that it is placed on the calendar and in the load
    - » Daily Load Checklist now has a check to verify requests
    - » TSDIS now double-checking that Integrated Reports contain requests

LIS Instrument

- All currents, voltages, and temperatures remain nominal
- MSFC realtime command requests executed on 99-132 and 99-148.
- A recent NASA press release features the LIS Instrument and its findings; for further information, reference the following URL:
  - http://science.nasa.gov/newhome/headlines/essd10jun99_2.htm

Ground System

- Event Report
  - #103: Late Acq. - View period shifted
- Configured last two data lines to PTPs
- Remote transfers down for past two weeks to two Langley machines
- New display case built
- Still awaiting word of five DRs to be fixed

Y2K

- String 3 awaiting final rollover testing before operations testing
- Langley remote displays now working
  - Marshall being worked (same problem)
- TSDIS SSH request approved and awaiting purchase of software